



Bathymetry and seafloor image surveys for benthic habitat mapping of Dokdo

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Dokdo (do means a island), our study area, is a volcanic island, which is located in the northeastern part of the Ulleung Back-Arc Basin, the East Sea and approximately 216.8 km away from the eastern part of the Korean peninsula. The Dokdo volcano anomalously emerges, rising abruptly from the sea floor (~2,100 m below sea level). Dokdo comprises two main islets (Seo-do and Dong-do) and the associated submerged volcanic edifice. To management the eco-system of coastal area and establish the policy against the change of marine environment, advanced nations for marine have conducted benthic habitat mapping studies like PIBHMC (Pacific Islands Benthic Habitat Mapping Center) and MESH (Mapping European Seabed Habitats) projects. For the benthic habitat mapping of the southern coastal area of Seo-do, the precise topographical map of the coastal area was made using the detailed bathymetry data from multi-beam echosounder (EM 3001, Kongsberg). The seafloor images of the survey area were obtained by Side Scan Sonar (4125, Edgetech). The grain size and TOC (Total Organic Carbon) of 6 surface sediment samples of the survey area were analyzed. We used small research vessels for this study, because of shallow water. The bathymetry data of the survey area show that the range of water depth is about from 1 m to 28 m and the underwater reefs are irregularly scattered and extended from inland of Seo-do, with shallow water depth (within about 10 m). In the underwater reefs area, the flank slopes are very steep and irregular, overlain by many large or small submerged rocks, indicating partial erosion due to waves, strong currents and weathering. And below ~15 m, the bathymetry gradually transitions to a relatively even undulation with a smooth slope. The seafloor images, from Side Scan Sonar, show that many large or small submerged rocks occur in the shallow water and other seabed area is covered with small gravels. The grain size of sediments is varied along bathymetric gradients. Gravel was dominated in shallow water whereas sand particles increased in deep water. TOC (Total Organic Carbon) values of the sediments are relatively high due to input of organic matters from islets and seagull excreta. Underwater video images are draped on the bathymetry for integrated analysis. The bathymetry, the integrated map, and the sediment data are fully utilized by benthic habitat mapping of Dokdo and habitat analysis of nearshore ecosystem.